AIR QUALITY ASSESSMENT

Ocotillo Wells Solar Project
(APN 253-390-57), (APN 253-290-58)
MUP 3300-12-004, ER 3910-12-12-001

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EXECUTIVE SUMMARY

This air quality analysis has been completed to determine air quality impacts, which may be associated with the construction of the proposed solar project. The project site is generally located within the northeastern area of the County of San Diego. The proposed project would consist of a solar generation facilities on two individual parcels of land with no additional lands affected to allow for the transport of power generated to the existing Imperial Irrigation District (IID).

The project proposes to grub and grade the site and move roughly 370,000 Cubic Yards (CY) of soil and then begin installing the photovoltaic arrays. During the Grading phase, the proposed project would be required to import approximately 13,000,000 gallons of water. All phases of the proposed project are anticipated to be completed by fall of 2013. Additionally, as part of the design all disturbed areas would be covered with decomposed granite or a binding agent to reduce dust once the project is constructed and operational.

During construction, the proposed project will produce fugitive dust and diesel particulate matter, Reactive Organic Gases, Oxides of Nitrogen, Carbon Monoxide and Sulfur Dioxide, however, only construction related PM_{10} without mitigation would be expected to exceed PM_{10} thresholds established by the County of San Diego. Implementation of mitigation activities described below will reduce construction emissions to below significance:

1. *Apply water during grading/grubbing activities to all active disturbed a Apply water during grading/grubbing activities to all active disturbed areas at least two times daily and use magnesium chloride or another County approved dust suppression additive to reduce dust.*
2. *Apply water to all onsite roadways at least two times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
3. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*
4. *Install Wheel Shakers at all egress locations onsite as necessary to remove mud from water trucks traveling to and from the project site.*

Furthermore, a screening-level health risk assessment was conducted to determine the potential for the project to result in a significant impact on nearby sensitive receptors during short-term construction activities. For purposes of this analysis, the primary pollutant of concern is diesel particulate matter (DPM) which is emitted by the operation of heavy diesel equipment during construction activities. The result of the health risk assessment indicates that the proposed project would not result in a health risk impact to either existing or future sensitive receptors near the project. The worst case emissions would be at 828 meters from the project and the risk would be 0.17 which is less than one in one million.

Cumulative impacts are not expected due to the fact that there are no identified nearby construction projects within the area. Also, given the fact that the proposed project is expected to reduce ozone precursors given it is a renewable non combustive energy project, the project would be expected to comply with the County's Regional Air Quality Strategy (RAQS).

Operations of the project would involve washing the panels and various maintenance activities onsite. These operations can generate dust onsite from onsite service roads. Therefore, the project would install permeable binding material or rock on all access roads to reduce dust. A worst case trip generation would be less than 25 daily trips and would only occur at this intensity during system maintenance. Therefore, Operational emissions would not be expected to exceed county screening thresholds. Furthermore, as a design feature, the project applicant will place either long-term soil binders or rock surfaces on access roadways as needed every couple of years to ensure that dust is kept at a minimum during maintenance operations.

Finally, the proposed Project would not be expected have a potential to create offensive odors to any substantial number of sensitive receptors or people given the nearest sensitive receptors are over 1/2 mile away to the west.

1.0 INTRODUCTION

1.1 Purpose of this Study

The purpose of this Air Quality study is to determine potential air quality impacts (if any) that may be created during the construction of a solar farm to be constructed near the town of Ocotillo Wells in eastern San Diego County adjacent to Imperial County. Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures, which would reduce those impacts to levels that are less than significant. Daily operations of the project will be primarily from maintenance and worker trips, although some emissions are expected, they would be minimal and below the screening level thresholds within the San Diego County Guidelines for Determining Significance.

1.2 Project Location

The Project is located within the Desert Subregional Plan Area in the Ocotillo Wells area of the unincorporated County of San Diego and would consist of a single solar generation facility on two separate parcels of land (253-390-57 & 58) with a general location near 33°03′ 58″ N and 116° 05′ 12″ W. The combined size of the two parcels is 440 acres however; the solar farm would only utilize 338 acres of the site. The project is located off a private easement road that connects to Split Mountain Road. Elevations onsite are generally flat ranging from about 75 to 90 feet above mean seal level. A general project vicinity map is shown in Figure 1–A on Page 3.

1.3 Project Description

The Project proponent is preparing an application for development and operation of a photovoltaic (PV) or concentrated photovoltaic (CPV) solar Project to be located on privately-held lands near Ocotillo Wells. The Project would require approval from the County of San Diego for a Major Use Permit (MUP) to allow for the construction, operation, and maintenance of such facilities for the long-term generation of clean renewable energy from solar power.

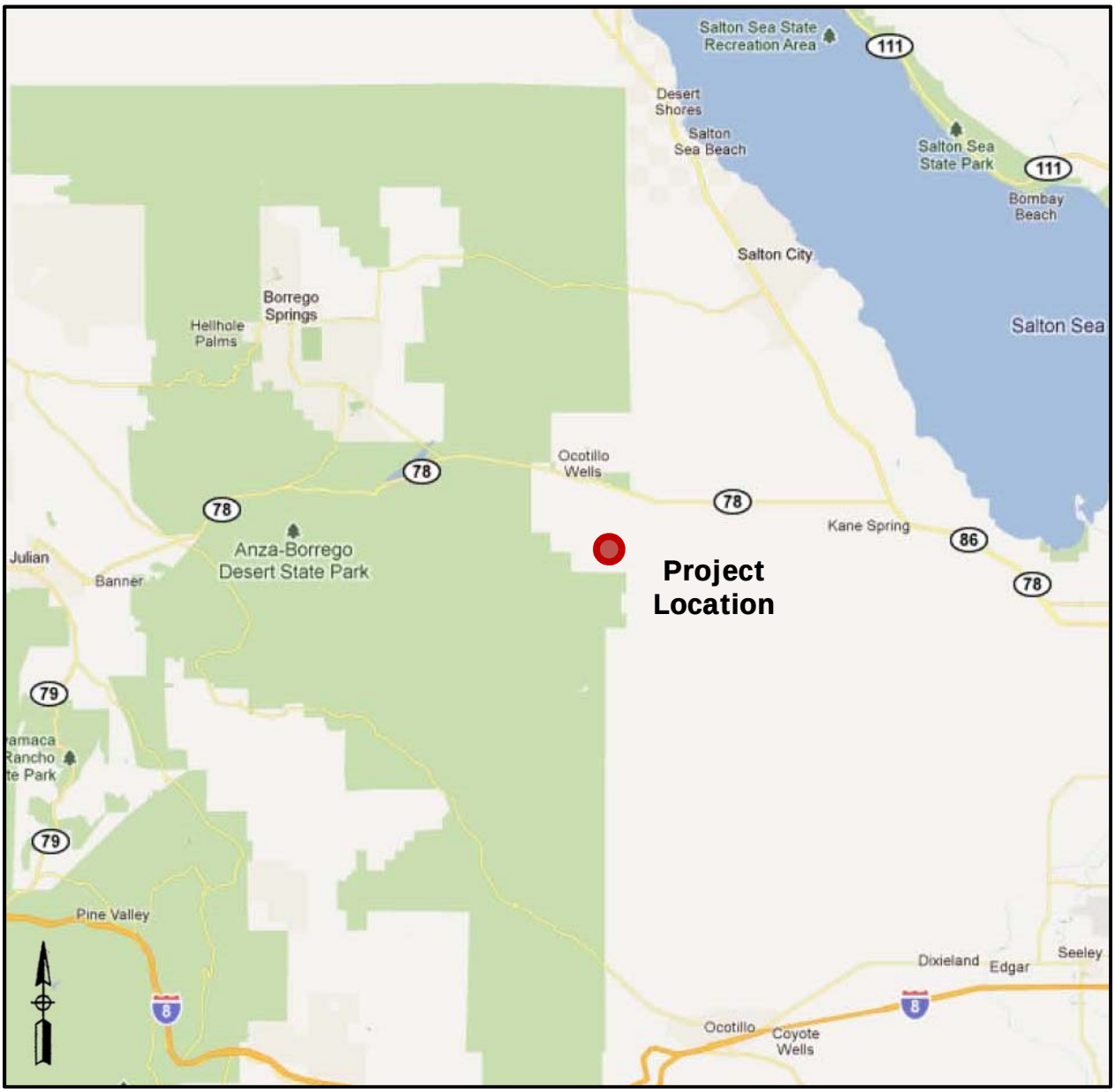
The County Assessor Parcel Numbers (APNs) that comprise the Project area for the main facilities are 253-390-57 and 253-390-58, totaling 440 acres (approximately 280 acres and 160 acres, respectively); however, the proposed Project development

footprint would total approximately 338.1 acres. The development footprint for the Project includes approximately 336.4 acres of the 440 acres, plus approximately 1.74 acres of disturbance for offsite improvements for access purposes (access road/easement from Split Mountain Road). The remaining 103.6 acres on the two affected parcels would remain in their natural state. Gildred Building Co., LLC currently owns APN 253-390-57 and APN 253-390-58. The Project site configuration and general layout is provided in Figure 1-B on Page 3.

To allow for flexibility in the ultimate type of technology utilized for construction of the solar Project, four variations of PV and CPV alternative technology systems are being considered by the Project applicant. The proposed development footprint would remain the same with any of the technology scenarios selected. In addition to the solar panels, development would include construction of two 10,000-gallon water storage tanks and an operations/maintenance building (approximately 1,040 s.f., height of 15-16 feet). Additionally, a substation (development footprint of approximately 62,500 s.f.) that would be dedicated to the Imperial Irrigation District (IID) and a private switchgear yard (development footprint of approximately 96,750 square feet, maximum height of 35 feet) with a control house are proposed; however, only a limited portion of these areas would support physical structures. The Dual-Axis Tracker System and the Dual-Axis Tracker Units, as described in detail below, would also require installation of six 125kW emergency generators located on a 12-foot by 20-foot concrete pad within the interior of the development area to enable the solar panels to be rotated to the stow position, in the event that power from the local utility is lost or when high winds occur.

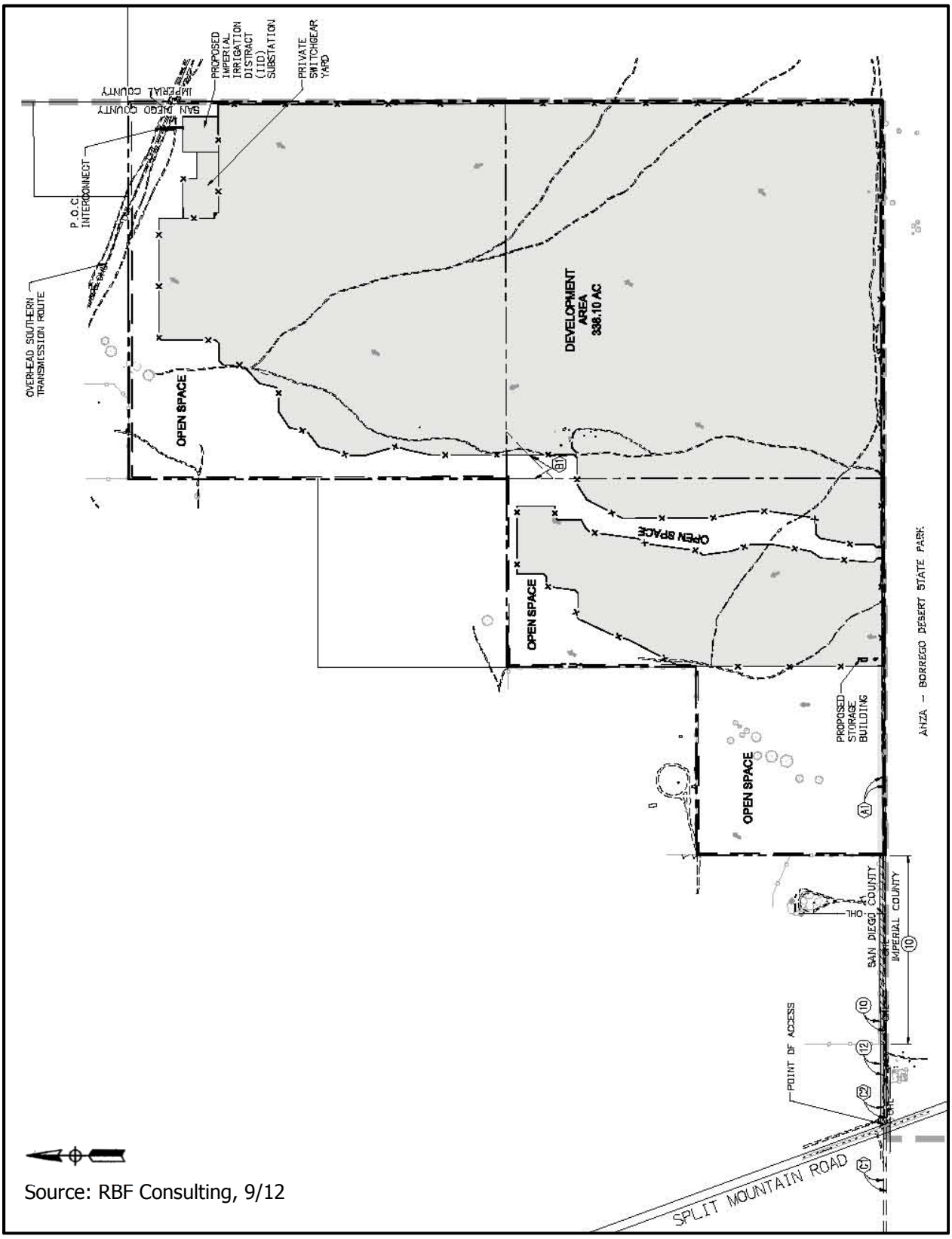
The energy generated by the Project with any of the four alternative technology systems would be transmitted via a central overhead 34kV collection line to the substation proposed in the northeast corner of the site, adjacent to an existing 92 kilovolt (kV) "R-Line" that runs through the northeastern corner of the affected parcel. The solar Project is proposed to be connected to the R-Line with an interconnection agreement with the IID. The R-Line runs aboveground and ultimately connects to the existing San Felipe Substation, located approximately 2.1 miles to the northwest of the point of interconnection.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 9/11

Figure 1-B: Overall Project Layout



Source: RBF Consulting, 9/12

Each of the four layouts would also require construction of a number of equipment pads to support small enclosures to house the associated inverters/transformers/switching gear. The total number of required equipment pads within the development footprint, as well as the combination of components that each would support (e.g. either transformers/inverters or breakers/transformers), would vary based upon the technology system selected.

The ultimate arrangement/number of solar panels, equipment pads and structures, and internal access roads are shown on the MUP Plot Plans prepared specific to each of the proposed solar technology systems; however, each of these layouts are subject to modification at final engineering design. Each of the four solar technology systems being considered is described in brief below.

Fixed-Axis Rack System

The Fixed-Axis Rack System would have an anticipated production capacity of approximately 42 MW (alternating current - AC). The Project design would consist of a series of PV solar panels on a fixed-axis rack system, installed on rack pilings of 4-6 inch diameter metal I-beams or 4-inch diameter round pipe.

The solar panels would be oriented along an east-west axis with the panels generally facing to the south to maximize solar absorption during the hours of daylight. The panels would be rack-mounted in a two-panel system (one panel mounted above a second panel). Panels (rack system) would measure approximately nine feet wide and approximately 51 feet in length, with a maximum of 10 feet in height, as measured from ground surface to the top of the panel.

Spacing between each row along the north/south axis would measure approximately 19 feet center to center. It's estimated that up to 42 individual equipment pads (approximately 15 feet by 40 feet, or 600 square feet in size) would be constructed within the solar array field to support the required inverters/transformers.

A series of north-south and/or east-west running all-weather fire access roads, of minimum 24-foot width and unsurfaced (covered with a binding agent), would be provided to meet design requirements of the San Diego County Fire Authority. These roads would also serve for purposes of maintenance.

Single-Axis Rack System

The Single-Axis Rack System would have an anticipated production capacity of up to 50 MW (alternating current). The Project design would consist of a series of single-axis tracking PV solar panels supported on driven pier footings.

The solar panels would be aligned in north/south rows and would face to the east in the morning and to the west in the evening hours, tracking the sun along the vertical axis to maximize solar absorption during the hours of daylight. The panels would be rack-mounted, measuring approximately seven feet in width and 90 feet in length (panel array), with a maximum height of 9.5 feet, as measured from the ground surface to the top of the panel.

Spacing between each row along the north/south axis would be approximately 17 feet center to center. It's estimated that up to 43 individual equipment pads (approximately 15 feet by 40 feet, or 600 square feet in size) would be constructed within the solar array field to support the required inverters/transformers.

A series of north-south and/or east-west running all-weather fire access roads, of minimum 24-foot width and unsurfaced (covered with a binding agent), would be provided per design requirements of the San Diego County Fire Authority. Additionally, a series of 24-foot wide unsurfaced roads would be provided within the solar field for purposes of maintenance.

Dual-Axis Rack System

The Dual-Axis Rack System would have an anticipated production capacity of approximately 45 MW (alternating current). The Project design would consist of a series of CPV solar panels installed on a dual-axis rack system. The solar arrays would be constructed on pile-driven pier footings.

The solar panels would be aligned in rows running along a north-south axis and would rotate to face the east in the morning and the west in the evening hours, tracking the sun along the vertical and horizontal axes to maximize solar absorption during the hours of daylight. As a dual-axis system, the panels could also be rotated along the north-south axis to change the angle of the panel, depending on the time of year, in order to maximize the absorption of sunlight.

Each row would contain a system of up to four arrays. Each array of panels would support a grouping of eight "paddles," with each paddle supporting eight modules of solar collectors. Each array would measure approximately 18.5 feet in width and 80 feet in length (panel array). The total height of the arrays would be approximately 23 feet in height, as measured from ground surface to the top of the panel.

Spacing between each row along the east-west axis would be approximately 53 feet center to center. An estimated 46 individual equipment pads (approximately 15 feet by 40 feet, or 600 square feet in size) would be constructed within the solar array field to support the breakers/transformers. Additionally, construction would include installation of six 125kW emergency generators (each located on a 12-foot by 20-foot building pad) to provide a reserve source of power in the case of power failure. The generators would provide energy to rotate the tracker units to the stow position in the event of an emergency or high winds.

A series of east-west running all-weather fire access roads, of minimum 24-foot width and unsurfaced (covered with a binding agent), would be provided approximately every 330 feet between the horizontal rows of panels, per design requirements of the San Diego County Fire Authority. Additionally, a series of unsurfaced roads would be provided within the solar field for purposes of maintenance.

Dual-Axis Tracker Units

The Dual-Axis Tracker Units would have an anticipated production capacity of approximately 54 MW (alternating current). The Project design would consist of series of CPV solar trackers installed on driven 24 inch to 30 inch pier footings/concrete foundation system.

The CPV trackers would be aligned in north/south rows and would face to the east in the morning and to the west in the evening hours, tracking the sun along both the horizontal and vertical axes to maximize solar absorption during the hours of daylight. Each tracker would measure approximately 25 feet wide and 48 feet in length, with a maximum height of 30 feet, as measured from ground surface to the top of the unit.

The series of CPV trackers would be spaced approximately 82 feet on-center east/west, and 69 feet on-center north/south. An estimated 40 individual equipment pads

(approximately 15 feet by 40 feet, or 600 square feet in size) would be constructed within the solar array field to support the required inverters/transformers. Additionally, construction would include installation of six 125kW emergency generators (each located on a 12-foot by 20-foot building pad) to provide a reserve source of power in the case of power failure. The generators would provide energy to rotate the tracker units to the stow position in the event of an emergency or high winds.

A series of north-south running all-weather fire access roads, of minimum 24-foot width and unsurfaced (covered with a binding agent), would be provided per design requirements of the San Diego County Fire Authority. Additionally, a series of north-south running unsurfaced roads would be provided within the solar field for purposes of maintenance.

2.0 EXISTING ENVIRONMENTAL SETTING

2.1 Existing Setting

The project site is comprised of two vacant lots situated within the desert. The nearest residential development is about ½ mile from the project site and no existing developments on site were noted during our site visit.

2.2 Climate and Meteorology

Climate within the San Diego Air Basin SDAB area varies dramatically over short geographical distances due to size and topography. Most of southern California is dominated by high-pressure systems for much of the year, which keeps the desert mostly sunny and warm. Typically, during the winter months, the high pressure system drops to the south and brings cooler, moister weather from the north.

It is common for inversion layers to develop within high-pressure areas, which mostly define pressure patterns over the SDAB. These inversions are caused when a thin layer of the atmosphere increases in temperature with height. An inversion acts like a lid preventing vertical mixing of air through convective overturning. Average temperatures in Ocotillo range from about 52 in the winter to over 90 degrees in the summer (Source: http://www.city-data.com/city/Ocotillo-California.html).

2.3 Regulatory Standards

2.3.1 Federal Standards and Definitions

The Federal Air Quality Standards were developed per the requirements of The Federal Clean Air Act, which is a federal law that was passed in 1970 and further amended in 1990. This law provides the basis for the national air pollution control effort. An important element of the act included the development of national ambient air quality standards (NAAQS) for major air pollutants.

The Clean Air Act established two types of air quality standards otherwise known as primary and secondary standards. ***Primary Standards*** set limits for the intention of protecting public health, which includes sensitive populations such as asthmatics, children and elderly. ***Secondary Standards*** set limits to protect public welfare to

include the protection against decreased visibility, damage to animals, crops, vegetation and buildings.

The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for principal pollutants, which are called "criteria" pollutants. These pollutants are defined below:

1. ***Carbon Monoxide (CO):*** *is a colorless, odorless, and tasteless gas and is produced from the partial combustion of carbon-containing compounds, notably in internal-combustion engines. Carbon monoxide usually forms when there is a reduced availability of oxygen present during the combustion process. Exposure to CO near the levels of the ambient air quality standards can lead to fatigue, headaches, confusion, and dizziness. CO interferes with the blood's ability to carry oxygen.*
2. ***Lead (Pb):*** *is a potent neurotoxin that accumulates in soft tissues and bone over time. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Because lead is only slowly excreted, exposures to small amounts of lead from a variety of sources can accumulate to harmful levels. Effects from inhalation of lead near the level of the ambient air quality standard include impaired blood formation and nerve conduction. Lead can adversely affect the nervous, reproductive, digestive, immune, and blood-forming systems. Symptoms can include fatigue, anxiety, short-term memory loss, depression, weakness in the extremities, and learning disabilities in children.*
3. ***Nitrogen Dioxide (NO_2):*** *is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract and is one of the nitrogen oxides emitted from high-temperature combustion, such as those occurring in trucks, cars, power plants, home heaters, and gas stoves. In the presence of other air contaminants, NO_2 is usually visible as a reddish-brown air layer over urban areas. NO_2 along with other traffic-related pollutants is associated with respiratory symptoms, respiratory illness and respiratory impairment. Studies in animals have reported biochemical, structural, and cellular changes in the lung when exposed to NO_2 above the level of the current state air quality standard. Clinical studies of human subjects suggest that NO_2 exposure to levels near the current standard may worsen the effect of allergens in allergic asthmatics, especially in children.*
4. ***Particulate Matter (PM_{10} or $PM_{2.5}$):*** *is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary in shape, size and chemical composition, and can be made up of multiple materials such as metal, soot, soil, and dust. PM_{10} particles are 10 microns (µm) or less and $PM_{2.5}$ particles are 2.5 (µm) or less. These particles can contribute significantly to regional haze and reduction of visibility in California. Exposure to PM levels exceeding current air quality standards increases the risk of allergies such as asthma and respiratory illness.*
5. ***Ozone (O_3)****: is a highly oxidative unstable gas capable of damaging the linings of the respiratory tract. This pollutant forms in the atmosphere through reactions between chemicals directly emitted from vehicles, industrial plants, and many other sources. Exposure to ozone above ambient air quality standards can lead to human health effects such as lung inflammation, tissue damage and impaired lung functioning. Ozone can also damage materials such as rubber, fabrics and plastics.*

6. ***Sulfur Dioxide (SO_2)****: is a gaseous compound of sulfur and oxygen and is formed when sulfur-containing fuel is burned by mobile sources, such as locomotives, ships, and off-road diesel equipment. SO_2 is also emitted from several industrial processes, such as petroleum refining and metal processing. Effects from SO_2 exposures at levels near the one-hour standard include bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, especially during exercise or physical activity. Children, the elderly, and people with asthma, cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most susceptible to these symptoms. Continued exposure at elevated levels of SO_2 results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality.*

2.3.2 State Standards and Definitions

The State of California Air Resources Board (CARB) sets the laws and regulations for air quality on the state level. The California Ambient Air Quality Standards (CAAQS) are either the same as or more restrictive then the NAAQS and also restrict four additional contaminants. Table 2.1 on the following page identifies both the NAAQS and CAAQS. Additional contaminants as regulated by the CAAQS are defined below.

1. ***Visibility Reducing Particles****: Particles in the Air that obstruct the visibility.*
2. ***Sulfates****: are salts of Sulfuric Acid. Sulfates occur as microscopic particles (aerosols) resulting from fossil fuel and biomass combustion. They increase the acidity of the atmosphere and form acid rain.*
3. ***Hydrogen Sulfide (H_2S)****: is a colorless, toxic and flammable gas with a recognizable smell of rotten eggs or flatulence. H_2S occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. Usually, H_2S is formed from bacterial breakdown of organic matter. Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness and possibly death.*
4. ***Vinyl Chloride****: also known as chloroethene and is a toxic, carcinogenic, colorless gas with a sweet odor. It is an industrial chemical mainly used to produce its polymer, polyvinyl chloride (PVC).*

2.3.3 Regional Standards

The State of California has 35 specific air districts, which are each responsible for ensuring that the criteria pollutants are below the NAAQS and CAAQS. Air basins that exceed either standard for any criteria pollutants are designated as "non-attainment areas" for that pollutant. Currently, there are 15 non-attainment areas for the federal ozone standard and two non-attainment areas for the $PM_{2.5}$ standard. The state therefore created the California State Implementation Plan (SIP), which is designed to provide control measures needed for attainment status.

Table 2.1: Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	Average Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m3)		0.075 ppm (147 µg/m3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m3	Gravimetric or Beta Attenuation	150 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m3		-		
Fine Particulate Matter PM2.5	24 Hour	No Separate State Standard		35 µg/m3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m3	Gravimetric or Beta Attenuation	15 µg/m3		
Carbon Monoxide (CO)	8 hour	9.0 ppm (10mg/m3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m3)	-	Non-Dispersive Infrared Photometry
	1 hour	20 ppm (23 mg/m3)		35 ppm (40 mg/m3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m3)		-	-	-
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m3)[8]	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 µg/m3)		0.100 ppm[8]	-	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	-	Ultraviolet Fluorescence	0.30 ppm (for Certain Areas)	-	Ultraviolet Flourescence; Spectrophotometry (Pararoosaniline Method)[9]
	24 Hour	0.04 ppm (105 µg/m3)		0.14 ppm (for Certain Areas)	-	
	3 Hour	-		-	0.5 ppm (1300 µg/m3)	
	1 Hour	0.25 ppm (655 µg/m3)		75 ppb (196 µg/m3) (See Footnote 9)	-	
Lead[10]	30 Day Average	1.5 µg/m3	Atomic Absorption	-		-
	Calendar Quarter			1.5 µg/m3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average			0.15 µg/m3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more (0.07 -30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape				
Sulfates	24 Hour	25 µg/m3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m3)	Ultraviolet Fluorescence			
Vinyl Chloride[10]	24 Hour	0.01 ppm (26 µg/m3)	Gas Chromatography			

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing articles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
9. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008
12. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: California Air Resources Board (6/7/12)

The San Diego Air Pollution Control District (SDAPCD) is the government agency which regulates sources of air pollution within San Diego County. Therefore, the SDAPCD developed a Regional Air Quality Strategy (RAQS) to provide control measures to try to achieve attainment status. Currently, San Diego is in "non-attainment" status for federal O_3 and the State PM_{10} and $PM_{2.5}$ however, an attainment plan is only available of O_3. The RAQS was adopted in 1992 and has been updated as recently as 2009 which was the latest update incorporating minor changes to the prior 2004 update.

The RAQS is largely based on population predictions by the San Diego Association of Governments (SANDAG). Projects that produce less growth that predicted by SANDAG would generally conform to the RAQS and projects create more growth that projected by SANDAG may create a significant impact assuming the project either produces unmitagble emission generation in excess of the regional standards. Also the project would be considered a significant impact if the project produces cumulative impacts.

The 2009 update mostly clarifies and enhances emission reductions by implementing new ozone precursors reduction measures for Volatile Organic Compounds (VOCs) and NO_x. The criteria pollutant standards are generally attained when each monitor within the region has had no exceedances during the previous three calendar years. A complete listing of the current attainment status with respect to both federal and state nonattainment status by pollutants for San Diego County is shown in Table 2.2.

Table 2.2: San Diego County Air Basin Attainment Status by Pollutant

San Diego County Air Basin Attainment Status by Pollutant			
Pollutant	Average Time	California Standards	Federal Standards
Ozone (O_3)	1 Hour	Non-attainment	No Federal Standard
	8 Hour		Basic Non-attainment
Respirable Particulate Matter (PM10)	24 Hour	Non-attainment	Unclassified[1]
	Annual Arithmetic Mean	No State Standard	Unclassified[2]

1. Data reflects status as of March 19, 2009.

2. Unclassified; indicates data are not sufficient for determining attainment or nonattainment.

3. Maintenance Area (defined by U.S. Department of Transportation) is any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

Table 2.2 Cont.: San Diego County Air Basin Attainment Status by Pollutant

San Diego County Air Basin Attainment Status by Pollutant			
Pollutant	Average Time	California Standards	Federal Standards
Fine Particulate Matter PM2.5	24 Hour	No State Standard	Attainment
	Annual Arithmetic Mean	Non-attainment	Attainment
Carbon Monoxide (CO)	8 hour	Attainment	Maintenance Area[3]
	1 hour		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	1 Hour	Attainment	No Federal Standard
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	No State Standard	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	No Federal Standard
Lead	30 Day Average	Attainment	No Federal Standard
	Calendar Quarter	No State Standard	Attainment
Visibility Reducing Particles	8 Hour (10AM to 6PM, PST)	Unclassified	No Federal Standard
Sulfates	24 Hour	Attainment	No Federal Standard
Hydrogen Sulfide	1 Hour	Unclassified	No Federal Standard

1. Data reflects status as of March 19, 2009.

2. Unclassified; indicates data are not sufficient for determining attainment or nonattainment.

3. Maintenance Area (defined by U.S. Department of Transportation) is any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

2.4 California Environmental Quality Act (CEQA) Significance Thresholds

The California Environmental Quality Act has provided a checklist to identify the significance of air quality impacts. These guidelines are found in Appendix G of the CEQA guidelines and are as follows:

AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

A: Conflict with or obstruct implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP)?

B: Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation?

C: Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard (PM10, PM2.5 or exceed quantitative thresholds for O3 precursors, oxides of nitrogen [NOX] and Volatile Organic Compounds [VOCs])?

D: Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations?

E: Create objectionable odors affecting a substantial number of people?

2.5 SDAPCD - Air Quality Impact Assessment Screening Thresholds

The SDAPCD has established thresholds in Rule 20.2 (NON - MAJOR STATIONARY SOURCES) for the preparation of Air Quality Impact Assessments (AQIA) and are for new or modified stationary sources. The County's Guidelines for Determining Significance and Report Format and Content Requirements state that these guidelines direct the use of SDAPCD's screening level thresholds in Rule 20.2 for compliance with CEQA as well. It should be noted: the thresholds for VOCs are based on significance thresholds from South Coast Air Quality Management District for the Coachella Valley. Should emissions be found to exceed these thresholds, additional modeling is required to demonstrate that the project's total air quality impacts are below the state and federal ambient air quality standards. These screening thresholds for construction and daily operations are shown in Table 2.3 on the following page.

Non Criteria pollutants such as Hazardous Air Pollutants (HAPs) or Toxic Air Contaminants (TACs) are also regulated by the SDAPCD. Rule 1200 (Toxic Air Contaminants - New Source Review) adopted on June 12, 1996, requires evaluation of potential health risks for any new, relocated, or modified emission unit which may increase emissions of one or more toxic air contaminants. The rule requires that projects that propose to increase cancer risk to between 1 and 10 in one million need to implement toxics best available control technology (T-BACT) or impose the most effective emission limitation, emission control device or control technique to reduce the cancer risk. At no time shall the project increase the cancer risk to over 10 in one million or a health hazard index (chronic and acute) greater than one.

Projects creating cancer risks less than one in one million are not required to implement T-BACT technology.

Table 2.3: Screening Threshold for Criteria Pollutants

Pollutant	Total Emissions (Pounds per Day)
Construction Emissions	
Respirable Particulate Matter (PM_{10} and $PM_{2.5}$)	100 and 55
Nitrogen Oxide (NO_x)	250
Sulfur Oxide (SO_x)	250
Carbon Monoxide (CO)	550
Volatile Organic Compounds (VOCs)	75
Reactive Organic Gases (ROG) SCAQMD	75
Operational Emissions	
Respirable Particulate Matter (PM_{10} and $PM_{2.5}$)	100 and 55
Nitrogen Oxide (NO_x)	250
Sulfur Oxide (SO_x)	250
Carbon Monoxide (CO)	550
Lead and Lead Compounds	3.2
Volatile Organic Compounds (VOCs)	75
Reactive Organic Gases (ROG) SCAQMD	75

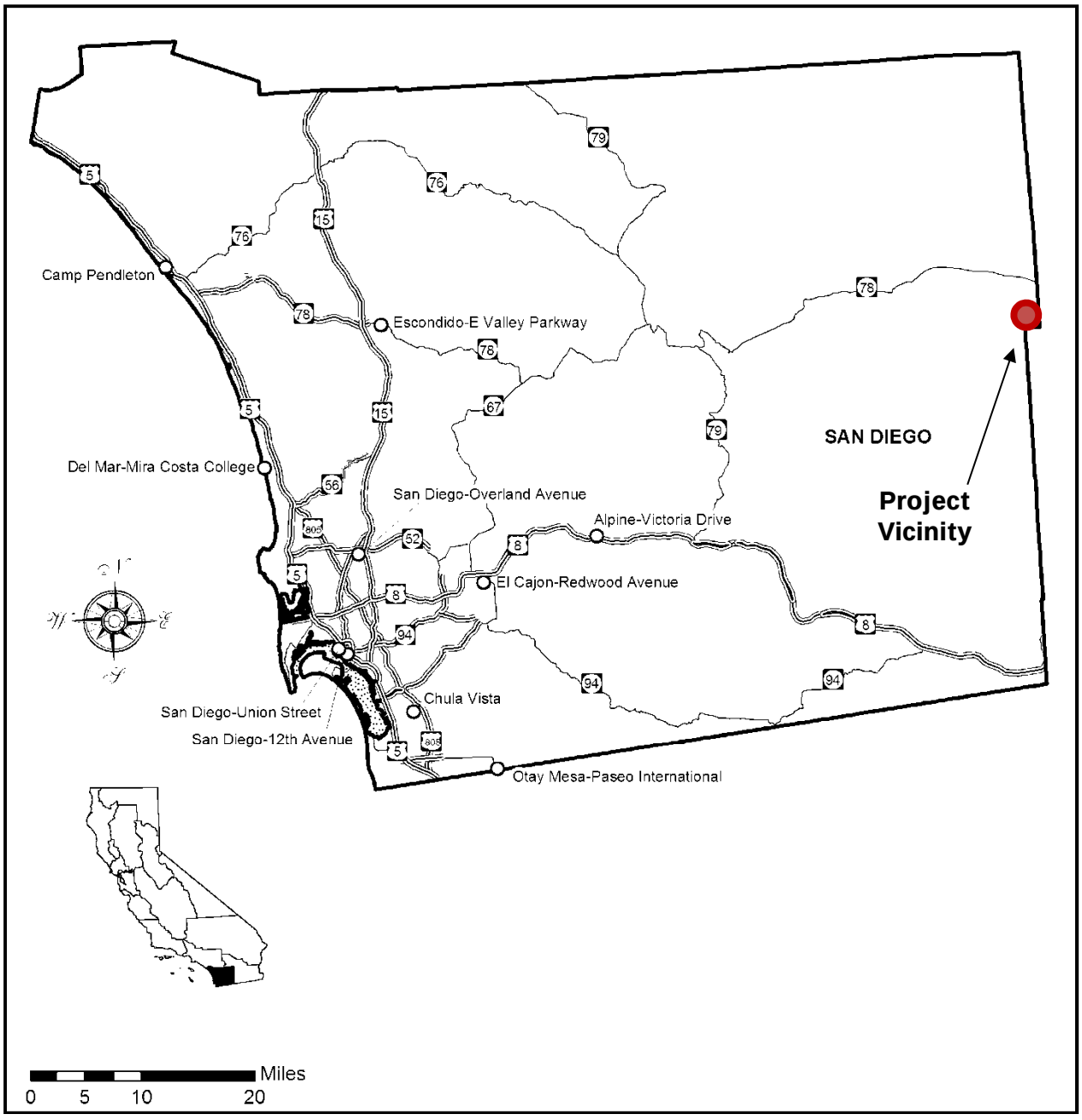
The U.S. Environmental Protection Agency (U.S. EPA) uses the term Volatile Organic Compounds (VOC) and the California Air Resources Board's (CARB's) Emission Inventory Branch (EIB) uses the term Reactive Organic Gases (ROG) to essentially define the same thing. There are minor deviations between compounds that define each term however for purposes of this study we will assume they are essentially the same due to the fact SCAQMD interchanges these words and because URBEMIS2007 directly calculates ROG in place of VOC.

2.6 Local Air Quality

Criteria pollutants are measured continuously throughout the San Diego Air Basin (SDAB). This data is used to track ambient air quality patterns throughout the County. As mentioned earlier, this data is also used to determine attainment status when compared to the NAAQS and CAAQS.

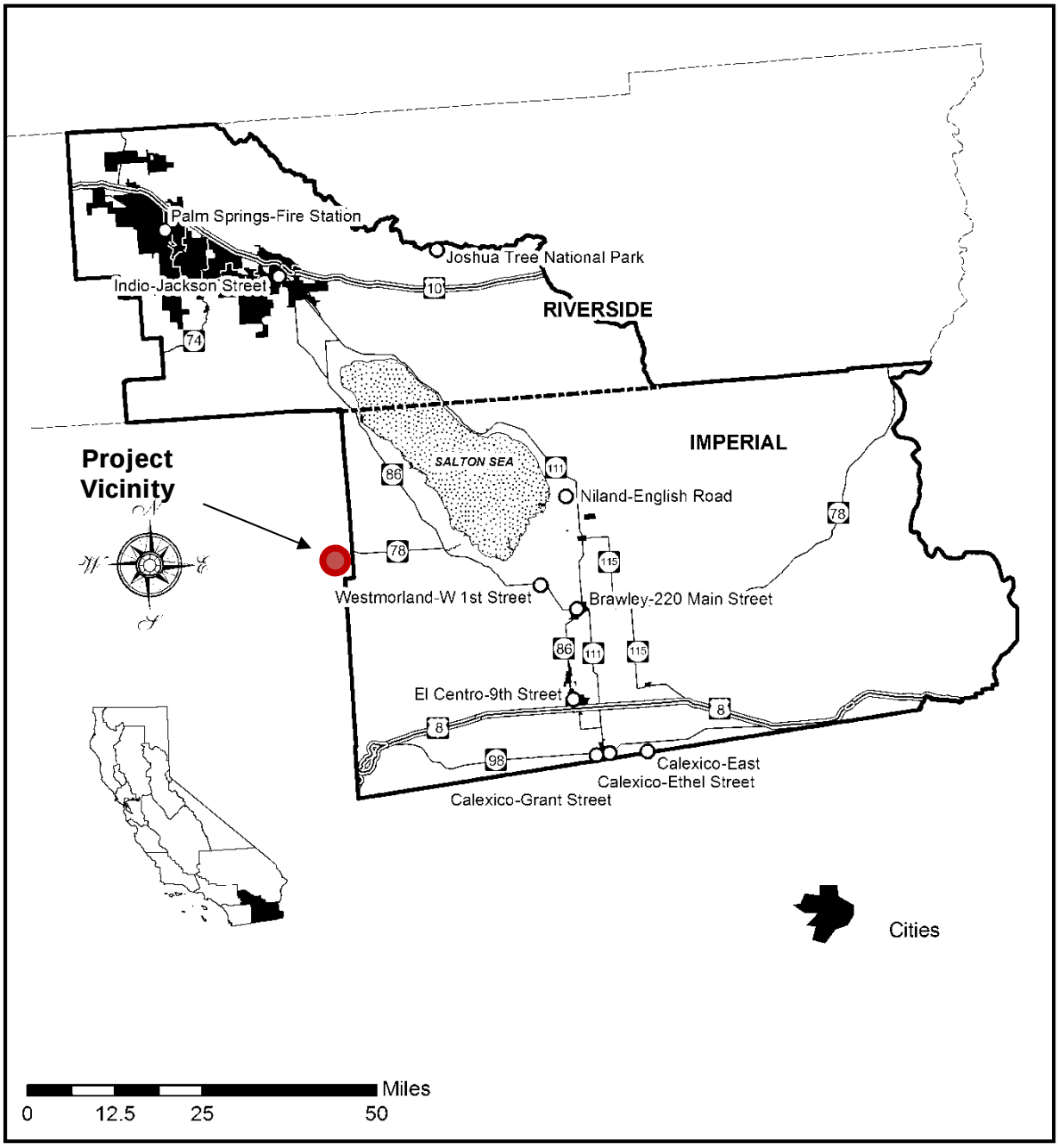
The SDAPCD is responsible for monitoring and reporting monitoring data. The District operates 10 monitoring sites that collect data on criteria pollutants as shown in Figure 2-A below:

FIGURE 2-A: Ambient Air Quality Monitoring Stations within SDAB – CARB



Additionally, because the project site is located on the eastern edge of the SDAB adjacent to the Salton Sea Air Basin (SSAB), SSAB monitoring sites were found to be much closer and more relevant to the project and were used to determine ambient air quality conditions. Figure 2-B shows the SSAB monitoring locations.

FIGURE 2-B: Ambient Air Quality Monitoring Stations within SSAB – CARB



The proposed development project is closest to the SSAB air quality monitoring stations - Westmoreland and Brawley and the SDAB air quality monitoring stations – El Cajon, Alpine and Calexico. The sites which are 27, 33, 55, 45 and 41 miles from the project site respectively. It should be noted that not all air quality monitoring stations measure all the same pollutants (Source: http://www.arb.ca.gov/adam /topfour/topfourdisplay.php). Table 2.4 below identifies the criteria pollutants monitored at these stations.

Table 2.4: Three-Year Ambient Air Quality Summary near the Project Site

Pollutant	Closest Recorded Ambient Monitoring Site	Averaging Time	CAAQS	NAAQS	2009	2010	2011
O3 (ppm)	Westmorland-W 1st Street	1 Hour	0.09 ppm	-	0.150	0.089	0.091
	Westmorland-W 1st Street	8 Hour	0.070 ppm	0.075 ppm	0.087	0.077	0.081
PM10 (µg/m3)	Westmorland-W 1st Street	24 Hour	50 µg/m3	150 µg/m3	161.4	86.0	74.6
	Westmorland-W 1st Street	Annual Arithmetic Mean	20 µg/m3	-	43.7	32.7	32.5
PM2.5 (µg/m3)	Brawley-220 Main Street	24 Hour	-	35 µg/m3	26.6	16.2	37.0
	Brawley-220 Main Street	Annual Arithmetic Mean	12 µg/m3	15 µg/m3	N/A	N/A	7.1
CO	Calexico-Ethel Street	8 Hour	9 ppm	9 ppm	7.46	4.46	N/A
	El Cajon	1 Hour	20 ppm	35 ppm	N/A	N/A	1.8
NO2 (ppm)	Alpine – Victoria Drive	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	0.008	0.007	0.006
	Alpine – Victoria Drive	1 Hour	0.18 ppm	-	0.056	0.052	0.040

3.0 METHODOLOGY

3.1 Construction Emissions Calculations

Air quality impacts related to the Project will be calculated using the latest URBEMIS2007 air quality model, which was developed by the California Air Resource Board (CARB). URBEMIS2007 has been approved by SDAPCD and the County of San Diego for construction emission calculations. URBEMIS incorporates emission factors from the EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions. The URBEMIS input/output model is shown in ***Attachment A*** at the end of this report.

Cancer Risk will be determined for Diesel Particulate Matter (DPM) at the point of maximum exposure. The SCREEN3 dispersion model can be used to determine the concentration for air pollutants at any location near the pollutant generator. Additionally, the model will predict the maximum exposure distance and concentration. The SCREEN3 input/output files are shown in ***Attachment B*** of this report. The worst case exhaust emissions generated from the Project from construction equipment was utilized and calculated within the URBEMIS2007 model. The worst case cancer risk if exposed to a DPM dose for 70 years is defined as:

$$CR_{DPM} = C_{DPM} \times URF_{DPM}$$

Where,

CR_{DPM} = Cancer risk from diesel particulate matter (probability on an individual developing Cancer

C_{DPM} = Annual average DPM concentration in µg/m3 (SCREEN3 predicts a 1-hr concentration and is corrected to an annual average by multiplying the 1-hr average by 0.08 (Source: U.S. EPA, 1992; ARB, 1994)

URF_{DPM} = The inhalation unit risk factor for diesel particulate was established by ARB as 300 in one million per continuous exposure of 1 µg/m3 of DPM over a 70-year period (Source: Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling emissions for CEQA Air Quality Analysis (August 2003)).

Non-Cancer risks or risks defined as chronic or acute are also known with respect to DPM and are determined by the hazard index. To calculate hazard index, DPM concentration is divided by its Reference Exposure Levels (REL). Where the total equals or exceeds one, a health hazard is presumed to exist. RELs are published by the Office of Environmental Health Hazard Assessment (Source:

http://www.oehha.ca.gov/air/allrels.html). Diesel Exhaust has a REL of 5 and targets the respiratory system.

3.2 Construction Assumptions

The Project will complete rough grading in approximately three months which would include all grubbing and site work in preparation for the either the CPV or PV systems. It's expected that approximately 370,000 CY of balanced earthwork will be required based on the worst case design chosen. Trenching and construction of the solar System would then begin and would be expected to be completed by mid-November. The total construction would be expected to be completed in roughly 11 months. During construction, the contractor will either drive piles or set concrete bases into the ground which the solar panels will be attached. Table 3.1 shows the expected timeframes for the construction process at the Project location.

Table 3.1: Expected Construction Equipment and Durations

Equipment Identification	Proposed Start	Proposed Completion	Quantity	Hours per day
Mass Site Grading	5/1/2013	8/8/2013		
Graders			3	8
Tractors/Loaders/Backhoes			5	8
Water Trucks			8	8
Rubber Tired Dozers			4	8
Trenching	8/9/2013	9/15/2013		
Tractors/Loaders/Backhoes			5	8
Trenchers			2	8
Water Trucks			1	8
Building Construction (PV Installation)	9/9/2013	2/15/2014		
Cranes			2	8
Air Compressors			2	7
Forklifts			1	8
Generator Sets			1	8
Other Industrial Equipment (Hydraulic Pile Driver)			1	8
Welders			1	8

This equipment list is based upon equipment inventory within URBEMIS2007. The quantity and types are based upon assumptions from projects of similar size and scope.

The proposed project will be importing approximately 13,000,000 gallons of water from an adjoining Water District located roughly 24 miles from the site. It's expected that 3,250 trucks trips (4,000 gallons each) will be needed to transport water onsite. If 6 trucks per hour would import the water, it would take 14 weeks to complete. This is a conservative approach since it is anticipated that it will take 15 minutes to fill each truck which is only four trucks per hour. This would require 20 weeks to complete and the daily emissions would be reduced.

3.2 Operational Assumptions

Operations of the project would involve washing the panels and various maintenance activities onsite. These operations can generate dust onsite from onsite service roads. Therefore, as a design feature, the project would apply long lasting soil binder or install crushed rock on all access roads to reduce dust. The project applicant will be required to identify the dust suppression sprays and or show the rock cross sections for all roads on the project site plans.

A worst case trip generation would be less than 25 daily trips daily and would only occur at this intensity during system maintenance. Therefore, Operational emissions would minimal and would not be expected to exceed county screening thresholds.

For purposes of providing a worst-case analysis, Ldn Consulting assumed that these occasional trips would occur daily and that these trips could originate over 100 miles away which would cover an adequate radius around the project for services such as maintenance.

4.0 FINDINGS

4.1 Construction Findings

The Project engineer expects that the only remaining structure onsite (a small abandoned well house) will be removed in about one hour. This action though considered demolition would not warrant analysis in URBEMIS due to the fact that the tear down wouldn't require heavy equipment beyond a small tractor. The project will complete rough grading in approximately three months which would include all grubbing and site work in preparation for the solar systems. It's expected that approximately 370,000 CY of balanced earthwork will be required. The project would also be required to truck in 13,000,000 gallons of water from roughly 24 miles from the site and would occur during the mass grading phase of the project. Trenching and construction of the solar System would then begin and would be expected to be completed by mid-November. The total construction would be expected to be completed in roughly 11 months.

Also, this analysis incorporates offsite work necessary for power line infrastructure. A summary of the construction emissions is shown in Table 4.1 below. Given these findings, PM_{10} and $PM_{2.5}$ emissions would exceed SDAPCD air quality standard of 100 and 55 lbs/day and would require mitigation to comply.

Table 4.1: Expected Construction Emissions Summary

Year	ROG	NO_x	CO	SO_2	PM_{10} (Dust)	PM_{10} (Exhaust)	PM_{10} (Total)	$PM_{2.5}$ (Dust)	$PM_{2.5}$ (Exhaust)	$PM_{2.5}$ (Total)
2013 (lb/day) Unmitigated	17.69	159.37	106.84	0.13	782.70	7.10	789.80	163.53	6.53	170.06
Significance Threshold (lb/day)	75	250	550	250	-	-	100	-	-	55
SDAPCD Impact?	No	No	No	No	-	-	Yes	-	-	Yes
2013 (lb/day) Mitigated	17.69	159.37	106.84	0.13	60.63	7.10	67.73	12.74	6.53	19.27
Significance Threshold (lb/day)	75	250	550	250	-	-	100	-	-	55
SDAPCD Impact?	**No**	**No**	**No**	**No**	**-**	**-**	**No**	**-**	**-**	**No**

It was found that the following mitigation measures would be required to reduce PM impacts to a level below significance:

5. *Apply water during grading/grubbing activities to all active disturbed a Apply water during grading/grubbing activities to all active disturbed areas at least two times daily and use magnesium chloride or another County approved dust suppression additive to reduce dust.*
6. *Apply water to all onsite roadways at least two times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
7. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*
8. *Install Wheel Shakers at all egress locations onsite as necessary to remove mud from water trucks traveling to and from the project site.*

The above mitigation recommendations are based on control efficiencies established by SCAQMD CEQA air quality handbook and recommended within the URBEMIS 2007 air quality model. The CEQA handbook states that watering twice daily can reduce PM10 from 34-68% however; Ldn Consulting utilized an average 51% efficiency. Given this, the project would not create emission that would violate any air quality standards or contribute substantially to any existing or projected air quality violations.

Furthermore, the project environmental documents did not identify any cumulative or nearby construction projects which may contribute to cumulative emissions however, given that the project construction period is relatively short and there are no known grading projects of considerable size within the area, no cumulative construction impacts are expected.

4.2 Health Risk

Based upon this air quality modeling, we find that worst-case PM_{10} from exhaust could be as high 7.10 lbs per construction day (8-hours) during the expected grading phase which would be over a 70 day period but was assumed over the entire construction period as a worst-case assumption. The emissions would be 0.07597 grams per second DPM during the construction day which would be

expected to be distributed over the disturbed project area of 338 acres. Converting pounds (lbs) per day to grams per second is shown below:

$$\frac{7.10\frac{lb}{day}*453\frac{grams}{lb}}{28{,}800\frac{\text{sec}onds}{Constructionday}}=0.1117\frac{grams}{\text{sec}ond}$$

The average emission rate over the grading area is $8.16x10^{-8}$ g/m^2/s, which was calculated as follows:

$$\frac{0.1117\frac{grams}{\text{sec}ond}}{338acres*4{,}046\frac{meters^2}{acre}}=8.16*10^{-8}\frac{\frac{grams}{meters^2}}{\text{sec}ond}$$

Utilizing the SCREEN3 dispersion model, we find that the peak maximum 1-hr concentration is 10.30 µg/m3 during the worst-case construction period. Converting the peak 1-hr concentration to an annual concentration reduces the concentration to 0.824 µg/m3. Therefore, utilizing the risk equation identified above and calculating the cancer risk over a 70 year continuous dose would be:

CR_{DPM} -70yr dose = 0.0003 x 0.824 = 0.00006648

Based on these calculations, The Project is expected to generate maximum DPM during grading of the project, however risk calculations are based on the entire duration of workdays which is expected to be no more than 202 construction days over a 70 year period. Converting the 202 construction days into 24 hour days or (202 x 8 ÷24) would yield 67.3-24 hour days over 70 years. There are 25,550 +/- days within a 70 year period so it would be expected that the CR_{DPM} would be 67.3days/25,550 days or 0.00263 times the CR_{DPM}. If one million people were exposed to the maximum DPM for the duration of grading at 828 meters from the project site, the estimated increased cancer risk could be:

0.00006648 x .00263 x 1,000,000 = 0.17 individuals per million

The numerical number of individuals exposed to DPM of this concentration from the project would be less than one in one million and would not be considered an

impact. The SCREEN3 dispersion model outputs are attached to this report. Also, it should be noted that every receptor outside of the 828 meter radius from the project would have a risk level lower than 0.17 individuals per 1 million exposed.

There are also known acute, chronic health risks associated with diesel exhaust which are considered non-cancer risks. This risk is calculated based on methods identified in Section 3.1. From this we find that the annual concentration of 0.824 µg/m3 divided by the REL of 5 µg/m3 yields a Health Hazard Index of 0.1648 which is less than one. Therefore no non-cancer risks are expected and all health risks are considered less than significant.

Furthermore, no additional projects are expected in the near vicinity of the project and would not cumulatively contribute any additional DPM emissions and would therefore not have a cumulative impact.

4.3 Regional Impacts

The proposed project would create an approximate 50 MW DC renewable energy source within the desert and would not therefore create impacts to the RAQS, in fact, the Project would decrease statewide emissions from combustible energy sources and would also reduce greenhouse gases. The project would not create significant ozone precursors which would reduce $O_{3.}$ The project would be acceptable and desirable under the RAQS and SIP.

4.4 Odor Impact Findings

The nearest sensitive receptor is 0.5 miles away and would not be expected to receive any objectionable odors from the proposed project. Operational odors generated from the project would not be expected. Therefore, no significant odor impacts are expected from the proposed project.

4.5 Conclusion of Findings

Based upon our analysis of construction activities for the proposed Ocotillo Wells Solar Farm, PM_{10} impacts are expected during the construction phase of the Project if mitigation measures are not employed. The following mitigation requirements will be required to reduce construction related impacts to a level below significance:

1. *Apply water during grading/grubbing activities to all active disturbed a Apply water during grading/grubbing activities to all active disturbed areas at least two times daily and use magnesium chloride or another County approved dust suppression additive to reduce dust.*
2. *Apply water to all onsite roadways at least two times daily or use of magnesium chloride or other County approved dust suppression additives and apply water one-time daily.*
3. *Reduce all construction related traffic speeds onsite to below 15 Miles per Hour (MPH).*
4. *Install Wheel Shakers at all egress locations onsite as necessary to remove mud from water trucks traveling to and from the project site.*

During operations of the project, dust would be expected on all access roads; however, the applicant has indicated that the project would incorporate Design Features which would install or apply long term soil binders or crushed rock. The project applicant will be required to identify the dust suppression compounds and expected design life and or show the rock cross sections for access and maintenance roads on the project site plans.

5.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the air quality environment and impacts within and surrounding the Ocotillo Wells Solar Farm development. The report was prepared by Jeremy Louden; a County approved CEQA Consultant for Air Quality.

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Date March 3, 2013

ATTACHMENT A

URBEMIS 2007

11/30/2012 10:20:58 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 8-5-12\Gildred Solar project\11-30-12\URBEMIS\Gildred 11-30.urb924

Project Name: Gildred Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (lbs/day unmitigated)	17.69	159.37	106.84	0.13	782.70	7.10	789.80	163.53	6.53	170.06	26,138.07
2013 TOTALS (lbs/day mitigated)	17.69	159.37	106.84	0.13	60.63	7.10	67.73	12.74	6.53	19.27	26,138.07

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3.56	0.11	0.98	0.00	0.13	0.03	79.38

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3.56	0.11	0.98	0.00	0.13	0.03	79.38

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

11/30/2012 10:20:58 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/1/2013-4/8/2013 Active Days: 70	**17.69**	**159.37**	**106.84**	**0.13**	**782.70**	**7.10**	**789.80**	**163.53**	**6.53**	**170.06**	**26,138.07**
Mass Grading 01/01/2013-04/08/2013	17.69	159.37	106.84	0.13	782.70	7.10	789.80	163.53	6.53	170.06	26,138.07
Mass Grading Dust	0.00	0.00	0.00	0.00	782.16	0.00	782.16	163.35	0.00	163.35	0.00
Mass Grading Off Road Diesel	13.75	111.46	58.22	0.00	0.00	5.27	5.27	0.00	4.85	4.85	12,610.44
Mass Grading On Road Diesel	3.30	46.10	16.22	0.08	0.31	1.72	2.03	0.10	1.58	1.68	8,972.25
Mass Grading Worker Trips	0.64	1.81	32.40	0.04	0.23	0.11	0.34	0.08	0.10	0.19	4,555.38
Time Slice 4/9/2013-5/15/2013 Active Days: 27	7.94	53.48	42.67	0.02	0.09	3.33	3.42	0.03	3.06	3.09	7,855.28
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	4.30	27.79	30.48	0.02	0.09	2.11	2.21	0.03	1.94	1.98	4,709.73
Trenching Off Road Diesel	4.05	27.07	17.53	0.00	0.00	2.07	2.07	0.00	1.90	1.90	2,887.58
Trenching Worker Trips	0.26	0.72	12.96	0.02	0.09	0.04	0.14	0.03	0.04	0.07	1,822.15
Time Slice 5/16/2013-11/15/2013 Active Days: 132	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

11/30/2012 10:20:58 PM

Total Acres Disturbed: 338

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5781 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 2228.57

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

8 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 4/9/2013 - 5/15/2013 - Trenching Phase One

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 4/9/2013 - 11/15/2013 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Other General Industrial Equipment (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

11/30/2012 10:20:58 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/1/2013-4/8/2013 Active Days: 70	**17.69**	**159.37**	**106.84**	**0.13**	60.63	**7.10**	67.73	12.74	**6.53**	19.27	**26,138.07**
Mass Grading 01/01/2013-04/08/2013	17.69	159.37	106.84	0.13	60.63	7.10	67.73	12.74	6.53	19.27	26,138.07
Mass Grading Dust	0.00	0.00	0.00	0.00	60.09	0.00	60.09	12.55	0.00	12.55	0.00
Mass Grading Off Road Diesel	13.75	111.46	58.22	0.00	0.00	5.27	5.27	0.00	4.85	4.85	12,610.44
Mass Grading On Road Diesel	3.30	46.10	16.22	0.08	0.31	1.72	2.03	0.10	1.58	1.68	8,972.25
Mass Grading Worker Trips	0.64	1.81	32.40	0.04	0.23	0.11	0.34	0.08	0.10	0.19	4,555.38
Time Slice 4/9/2013-5/15/2013 Active Days: 27	7.94	53.48	42.67	0.02	0.09	3.33	3.42	0.03	3.06	3.09	7,855.28
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	4.30	27.79	30.48	0.02	0.09	2.11	2.21	0.03	1.94	1.98	4,709.73
Trenching Off Road Diesel	4.05	27.07	17.53	0.00	0.00	2.07	2.07	0.00	1.90	1.90	2,887.58
Trenching Worker Trips	0.26	0.72	12.96	0.02	0.09	0.04	0.14	0.03	0.04	0.07	1,822.15
Time Slice 5/16/2013-11/15/2013 Active Days: 132	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

11/30/2012 10:20:58 PM

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
PV Park	3.56	0.11	0.98	0.00	0.13	0.03	79.38
TOTALS (lbs/day, unmitigated)	3.56	0.11	0.98	0.00	0.13	0.03	79.38

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

11/30/2012 10:20:58 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
PV Park		0.07	acres	368.00	25.76	77.28
					25.76	77.28

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.6	1.0	98.8	0.2
Light Truck < 3750 lbs	10.9	1.8	93.6	4.6
Light Truck 3751-5750 lbs	21.8	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.6	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	62.9	37.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	100.0	0.0	100.0	100.0	100.0	0.0

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	90.0	0.0	10.0			
% of Trips - Commercial (by land use)						
PV Park				2.0	1.0	97.0

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 100 miles

Home-based shop urban trip length changed from 7.3 miles to 0 miles

Home-based other urban trip length changed from 7.5 miles to 100 miles

Commercial-based commute urban trip length changed from 9.5 miles to 100 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 100 miles

Commercial-based customer urban trip length changed from 7.35 miles to 0 miles

11/30/2012 10:21:13 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Jeremy 8-5-12\Gildred Solar project\11-30-12\URBEMIS\Gildred 11-30.urb924

Project Name: Gildred Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (lbs/day unmitigated)	17.69	159.37	106.84	0.13	782.70	7.10	789.80	163.53	6.53	170.06	26,138.07
2013 TOTALS (lbs/day mitigated)	17.69	159.37	106.84	0.13	60.63	7.10	67.73	12.74	6.53	19.27	26,138.07

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.11	0.16	1.23	0.00	0.13	0.03	69.27

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.11	0.16	1.23	0.00	0.13	0.03	69.27

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

11/30/2012 10:21:14 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/1/2013-4/8/2013 Active Days: 70	**17.69**	**159.37**	**106.84**	**0.13**	**782.70**	**7.10**	**789.80**	**163.53**	**6.53**	**170.06**	**26,138.07**
Mass Grading 01/01/2013-04/08/2013	17.69	159.37	106.84	0.13	782.70	7.10	789.80	163.53	6.53	170.06	26,138.07
Mass Grading Dust	0.00	0.00	0.00	0.00	782.16	0.00	782.16	163.35	0.00	163.35	0.00
Mass Grading Off Road Diesel	13.75	111.46	58.22	0.00	0.00	5.27	5.27	0.00	4.85	4.85	12,610.44
Mass Grading On Road Diesel	3.30	46.10	16.22	0.08	0.31	1.72	2.03	0.10	1.58	1.68	8,972.25
Mass Grading Worker Trips	0.64	1.81	32.40	0.04	0.23	0.11	0.34	0.08	0.10	0.19	4,555.38
Time Slice 4/9/2013-5/15/2013 Active Days: 27	7.94	53.48	42.67	0.02	0.09	3.33	3.42	0.03	3.06	3.09	7,855.28
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	4.30	27.79	30.48	0.02	0.09	2.11	2.21	0.03	1.94	1.98	4,709.73
Trenching Off Road Diesel	4.05	27.07	17.53	0.00	0.00	2.07	2.07	0.00	1.90	1.90	2,887.58
Trenching Worker Trips	0.26	0.72	12.96	0.02	0.09	0.04	0.14	0.03	0.04	0.07	1,822.15
Time Slice 5/16/2013-11/15/2013 Active Days: 132	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

11/30/2012 10:21:14 PM

Total Acres Disturbed: 338

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5781 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 2228.57

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

8 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 4/9/2013 - 5/15/2013 - Trenching Phase One

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 4/9/2013 - 11/15/2013 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Other General Industrial Equipment (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

11/30/2012 10:21:14 PM

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 1/1/2013-4/8/2013 Active Days: 70	**17.69**	**159.37**	**106.84**	**0.13**	60.63	**7.10**	67.73	12.74	**6.53**	19.27	**26,138.07**
Mass Grading 01/01/2013-04/08/2013	17.69	159.37	106.84	0.13	60.63	7.10	67.73	12.74	6.53	19.27	26,138.07
Mass Grading Dust	0.00	0.00	0.00	0.00	60.09	0.00	60.09	12.55	0.00	12.55	0.00
Mass Grading Off Road Diesel	13.75	111.46	58.22	0.00	0.00	5.27	5.27	0.00	4.85	4.85	12,610.44
Mass Grading On Road Diesel	3.30	46.10	16.22	0.08	0.31	1.72	2.03	0.10	1.58	1.68	8,972.25
Mass Grading Worker Trips	0.64	1.81	32.40	0.04	0.23	0.11	0.34	0.08	0.10	0.19	4,555.38
Time Slice 4/9/2013-5/15/2013 Active Days: 27	7.94	53.48	42.67	0.02	0.09	3.33	3.42	0.03	3.06	3.09	7,855.28
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	4.30	27.79	30.48	0.02	0.09	2.11	2.21	0.03	1.94	1.98	4,709.73
Trenching Off Road Diesel	4.05	27.07	17.53	0.00	0.00	2.07	2.07	0.00	1.90	1.90	2,887.58
Trenching Worker Trips	0.26	0.72	12.96	0.02	0.09	0.04	0.14	0.03	0.04	0.07	1,822.15
Time Slice 5/16/2013-11/15/2013 Active Days: 132	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building 04/09/2013-11/15/2013	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Off Road Diesel	3.63	25.69	12.18	0.00	0.00	1.21	1.21	0.00	1.12	1.12	3,145.55
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

11/30/2012 10:21:14 PM

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
PV Park	0.11	0.16	1.23	0.00	0.13	0.03	69.27
TOTALS (lbs/day, unmitigated)	0.11	0.16	1.23	0.00	0.13	0.03	69.27

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

11/30/2012 10:21:14 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
PV Park		0.07	acres	368.00	25.76	77.28
					25.76	77.28

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.6	1.0	98.8	0.2
Light Truck < 3750 lbs	10.9	1.8	93.6	4.6
Light Truck 3751-5750 lbs	21.8	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.6	1.0	99.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	62.9	37.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	100.0	0.0	100.0	100.0	100.0	0.0

11/30/2012 10:21:14 PM

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	90.0	0.0	10.0			
% of Trips - Commercial (by land use)						
PV Park				2.0	1.0	97.0

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 100 miles

Home-based shop urban trip length changed from 7.3 miles to 0 miles

Home-based other urban trip length changed from 7.5 miles to 100 miles

Commercial-based commute urban trip length changed from 9.5 miles to 100 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 100 miles

Commercial-based customer urban trip length changed from 7.35 miles to 0 miles

11/30/2012 10:21:31 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Jeremy 8-5-12\Gildred Solar project\11-30-12\URBEMIS\Gildred 11-30.urb924

Project Name: Gildred Solar Project

Project Location: California State-wide

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013 TOTALS (tons/year unmitigated)	0.97	8.00	5.12	0.00	27.40	0.37	27.77	5.72	0.34	6.07	1,228.49
2013 TOTALS (tons/year mitigated)	0.97	8.00	5.12	0.00	2.12	0.37	2.50	0.45	0.34	0.79	1,228.49
Percent Reduction	0.00	0.00	0.00	0.00	92.25	0.00	91.01	92.20	0.00	86.98	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.44	0.02	0.19	0.00	0.02	0.00	13.87

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.44	0.02	0.19	0.00	0.02	0.00	13.87

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2013	0.97	8.00	5.12	0.00	27.40	0.37	27.77	5.72	0.34	6.07	1,228.49
Mass Grading 01/01/2013-04/08/2013	0.62	5.58	3.74	0.00	27.39	0.25	27.64	5.72	0.23	5.95	914.83
Mass Grading Dust	0.00	0.00	0.00	0.00	27.38	0.00	27.38	5.72	0.00	5.72	0.00
Mass Grading Off Road Diesel	0.48	3.90	2.04	0.00	0.00	0.18	0.18	0.00	0.17	0.17	441.37
Mass Grading On Road Diesel	0.12	1.61	0.57	0.00	0.01	0.06	0.07	0.00	0.06	0.06	314.03
Mass Grading Worker Trips	0.02	0.06	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.44
Building 04/09/2013-11/15/2013	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Off Road Diesel	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	0.06	0.38	0.41	0.00	0.00	0.03	0.03	0.00	0.03	0.03	63.58
Trenching Off Road Diesel	0.05	0.37	0.24	0.00	0.00	0.03	0.03	0.00	0.03	0.03	38.98
Trenching Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.60

Phase Assumptions

Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

Total Acres Disturbed: 338

Maximum Daily Acreage Disturbed: 10

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 5781 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 2228.57

Off-Road Equipment:

5 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

3 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

4 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

8 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 4/9/2013 - 5/15/2013 - Trenching Phase One

Off-Road Equipment:

5 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Building Construction 4/9/2013 - 11/15/2013 - Construction of PV systems Phase One

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

2 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day

1 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Other General Industrial Equipment (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

2013	0.97	8.00	5.12	0.00	2.12	0.37	2.50	0.45	0.34	0.79	1,228.49
Mass Grading 01/01/2013-04/08/2013	0.62	5.58	3.74	0.00	2.12	0.25	2.37	0.45	0.23	0.67	914.83
Mass Grading Dust	0.00	0.00	0.00	0.00	2.10	0.00	2.10	0.44	0.00	0.44	0.00
Mass Grading Off Road Diesel	0.48	3.90	2.04	0.00	0.00	0.18	0.18	0.00	0.17	0.17	441.37
Mass Grading On Road Diesel	0.12	1.61	0.57	0.00	0.01	0.06	0.07	0.00	0.06	0.06	314.03
Mass Grading Worker Trips	0.02	0.06	1.13	0.00	0.01	0.00	0.01	0.00	0.00	0.01	159.44
Building 04/09/2013-11/15/2013	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Off Road Diesel	0.29	2.04	0.97	0.00	0.00	0.10	0.10	0.00	0.09	0.09	250.07
Building Vendor Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenching 04/09/2013-05/15/2013	0.06	0.38	0.41	0.00	0.00	0.03	0.03	0.00	0.03	0.03	63.58
Trenching Off Road Diesel	0.05	0.37	0.24	0.00	0.00	0.03	0.03	0.00	0.03	0.03	38.98
Trenching Worker Trips	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.60

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 1/1/2013 - 4/8/2013 - Grubbing and Mass Grading

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

For Soil Stablizing Measures, the Equipment loading/unloading mitigation reduces emissions by:

PM10: 69% PM25: 69%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 51% PM25: 51%

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
PV Park	0.44	0.02	0.19	0.00	0.02	0.00	13.87
TOTALS (tons/year, unmitigated)	0.44	0.02	0.19	0.00	0.02	0.00	13.87

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
PV Park		0.07	acres	368.00	25.76	77.28
					25.76	77.28

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.6	1.0	98.8	0.2
Light Truck < 3750 lbs	10.9	1.8	93.6	4.6
Light Truck 3751-5750 lbs	21.8	0.5	99.0	0.5
Med Truck 5751-8500 lbs	9.6	1.0	99.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.7	0.0	42.9	57.1
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	62.9	37.1	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	0.0	90.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	100.0	0.0	100.0	100.0	100.0	0.0
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	90.0	0.0	10.0			
% of Trips - Commercial (by land use)						
PV Park				2.0	1.0	97.0

Operational Changes to Defaults

Home-based work urban trip length changed from 10.8 miles to 100 miles

Operational Changes to Defaults

Home-based shop urban trip length changed from 7.3 miles to 0 miles

Home-based other urban trip length changed from 7.5 miles to 100 miles

Commercial-based commute urban trip length changed from 9.5 miles to 100 miles

Commercial-based non-work urban trip length changed from 7.35 miles to 100 miles

Commercial-based customer urban trip length changed from 7.35 miles to 0 miles

ATTACHMENT B

SCREEN 3

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

Gildred Solar Farm

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE                =         AREA
   EMISSION RATE (G/(S-M**2))  =      .816000E-07
   SOURCE HEIGHT (M)          =       3.0000
   LENGTH OF LARGER SIDE (M)   =    1169.5400
   LENGTH OF SMALLER SIDE (M)  =    1169.5400
   RECEPTOR HEIGHT (M)        =       1.5000
   URBAN/RURAL OPTION         =        RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

   MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION


BUOY. FLUX =     .000 M**4/S**3;  MOM. FLUX =     .000 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN AUTOMATED DISTANCES ***
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*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***
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DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
10.	7.016	6	1.0	1.0	10000.0	3.00	45.
100.	7.457	6	1.0	1.0	10000.0	3.00	45.
200.	7.906	6	1.0	1.0	10000.0	3.00	45.
300.	8.270	6	1.0	1.0	10000.0	3.00	45.
400.	8.699	6	1.0	1.0	10000.0	3.00	45.
500.	9.106	6	1.0	1.0	10000.0	3.00	45.
600.	9.491	6	1.0	1.0	10000.0	3.00	45.
700.	9.858	6	1.0	1.0	10000.0	3.00	45.
800.	10.21	6	1.0	1.0	10000.0	3.00	45.
900.	9.771	6	1.0	1.0	10000.0	3.00	45.
1000.	8.732	6	1.0	1.0	10000.0	3.00	45.
1100.	7.896	6	1.0	1.0	10000.0	3.00	45.
1200.	7.240	6	1.0	1.0	10000.0	3.00	45.
1300.	6.718	6	1.0	1.0	10000.0	3.00	45.
1400.	6.301	6	1.0	1.0	10000.0	3.00	45.
1500.	5.953	6	1.0	1.0	10000.0	3.00	45.
1600.	5.659	6	1.0	1.0	10000.0	3.00	45.
1700.	5.405	6	1.0	1.0	10000.0	3.00	45.
1800.	5.181	6	1.0	1.0	10000.0	3.00	45.
1900.	4.981	6	1.0	1.0	10000.0	3.00	45.
2000.	4.802	6	1.0	1.0	10000.0	3.00	45.
2100.	4.640	6	1.0	1.0	10000.0	3.00	45.
2200.	4.491	6	1.0	1.0	10000.0	3.00	45.
2300.	4.357	6	1.0	1.0	10000.0	3.00	45.
2400.	4.233	6	1.0	1.0	10000.0	3.00	45.
2500.	4.120	6	1.0	1.0	10000.0	3.00	45.
2600.	4.015	6	1.0	1.0	10000.0	3.00	45.
2700.	3.919	6	1.0	1.0	10000.0	3.00	45.
2800.	3.831	6	1.0	1.0	10000.0	3.00	45.

					SCREEN		
2900.	3.748	6	1.0	1.0	10000.0	3.00	45.
3000.	3.671	6	1.0	1.0	10000.0	3.00	45.
3500.	3.343	6	1.0	1.0	10000.0	3.00	45.
4000.	3.091	6	1.0	1.0	10000.0	3.00	45.
4500.	2.883	6	1.0	1.0	10000.0	3.00	45.
5000.	2.704	6	1.0	1.0	10000.0	3.00	45.
5500.	2.548	6	1.0	1.0	10000.0	3.00	45.
6000.	2.411	6	1.0	1.0	10000.0	3.00	45.
6500.	2.288	6	1.0	1.0	10000.0	3.00	45.
7000.	2.180	6	1.0	1.0	10000.0	3.00	45.
7500.	2.084	6	1.0	1.0	10000.0	3.00	45.
8000.	1.998	6	1.0	1.0	10000.0	3.00	45.
8500.	1.919	6	1.0	1.0	10000.0	3.00	45.
9000.	1.845	6	1.0	1.0	10000.0	3.00	45.
9500.	1.777	6	1.0	1.0	10000.0	3.00	44.
10000.	1.713	6	1.0	1.0	10000.0	3.00	45.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 10. M:

828.	10.30	6	1.0	1.0	10000.0	3.00	45.

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*** SUMMARY OF SCREEN MODEL RESULTS ***
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CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	10.30	828.	0.

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** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
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